ICS #7-65

25X1A

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September 3, 1964

25X1A [redacted]

**DECLASS REVIEW by NIMA/DOD**

Reference: February 5, 1964 Letter

25X1A Subject: [redacted]

Gentlemen:

25X1A

Since the referenced letter, [redacted] technical personnel with guidance from your technical representative have performed another thorough review of the Panoramic Stereoviewer. The result of this review and the proposed tasks to complete the program are discussed in enclosure "A" to this letter.

The problem of successfully grinding and polishing glass drums for the instrument has been solved. [redacted] on Company funds, 25X1A was able to obtain a subcontractor who has successfully completed four drums. They remain to be assembled to the instrument.

The cost status of the contract is detailed in enclosure "B" to this letter. Accumulated expenditures are adjusted to actual rate for 1962 and 1963 as well as the provisional rates for 1964.

25X1A Please refer to [redacted] letter of 9/1/64 regarding these

25X1A rates for [redacted]

| | | |
|---|---|---|
| Estimated total contract cost | [redacted] | 25X1A |
| Allocated contract funds | | |
| Total new contract price | | |

It is estimated that the Panoramic Stereoviewer can be completed within 120 days after your approval of this request for additional funds and approval of the subcontractor. The manual of operation and maintenance and residual inventory list will be completed 30 days thereafter.

If you require additional information to complete your evaluation

25X1A contact me at [redacted]

Group 1
Excluded from automatic downgrading and declassification

25X1A

Very truly yours,

[redacted]

RHT:bp
Enc.

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ENCLOSURE "A"



# DESCRIPTION OF PROPOSED MODIFICATIONS TO THE PANORAMIC STEREOVIEWER

## GENERAL

The modification proposed for the Panoramic Stereoviewer is for the purpose of improving the operational performance and reliability of the instrument. In addition, the modification will permit a large reduction in the required tension on the film. Tests conducted on the present instrument indicate that the tension should be reduced to protect the film from damage. The combination of film tension and the inherent eccentricities in the core axis and flanges of film spools causes chafing of the edges of the film which results in scalloping and tearing of the edges of the film.

On the present instrument the film tension is maintained high to assure adequate friction between the film and the plexiglass drum surface for the film to drive the drum when in motor drive and for the drums to drive the film when in manual drive. In addition to a high film tension it was found necessary to add elastic friction bands to the plexiglass drums to maintain a sufficient coefficient of friction between the drum and the film.

The proposed modification will eliminate the need for bands on the drum surface to increase friction and it is estimated that the film tension will be reduced to approximately one-half the present tension. The motor drives and controllers now on the instrument will be used fully and the manual control handwheels on the center column will be retained. The drive modification will be primarily in the mechanical linkage from the handwheels to the drums and the addition of friction and idler rollers in the film loop over the drum.

In addition to the modification in the film drive, glass drums will replace the plexiglass drums on the instrument. The glass drums will be less subject to abrasion and will be of a superior optical quality. Reticles will be installed in the optical viewing system to serve as a reference for the X and Y counters. A head rest will be added to assist the operator in holding his head in the proper orientation for viewing. Blue diffusers will be added to the optical condensing system to eliminate the yellow color in the illuminated format when the tungsten lamps are operated at a low color temperature. The present rings on the rotation prisms will be replaced with rings engraved to indicate the angular orientation of the prisms. Also there will be several minor modifications to improve the operating performance, stability and appearance of the instrument such as: resurfacing mirrors in the condensing systems, covering the table surface with vinyl, refining the electrical balance of the drive system, strengthen the door frames on the cabinet, strengthening the mechanical coupling in the drive system and adding identification and instruction plates.

DRIVE MODIFICATION

The drive modification will be essentially a mechanical modification. As illustrated in Figure #1, a pair of rubber coated friction rollers and two idler rollers will be added to the film loop over the glass drum stages. One of the friction rollers will be in contact with the drum and with the second friction roller. The second friction roller will make contact with the film. The idler rollers will be positioned on either side of the friction rollers to maintain the maximum amount of wrap-around surface contact between the film and

# PANORAMIC VIEWER
## FILM DRIVE

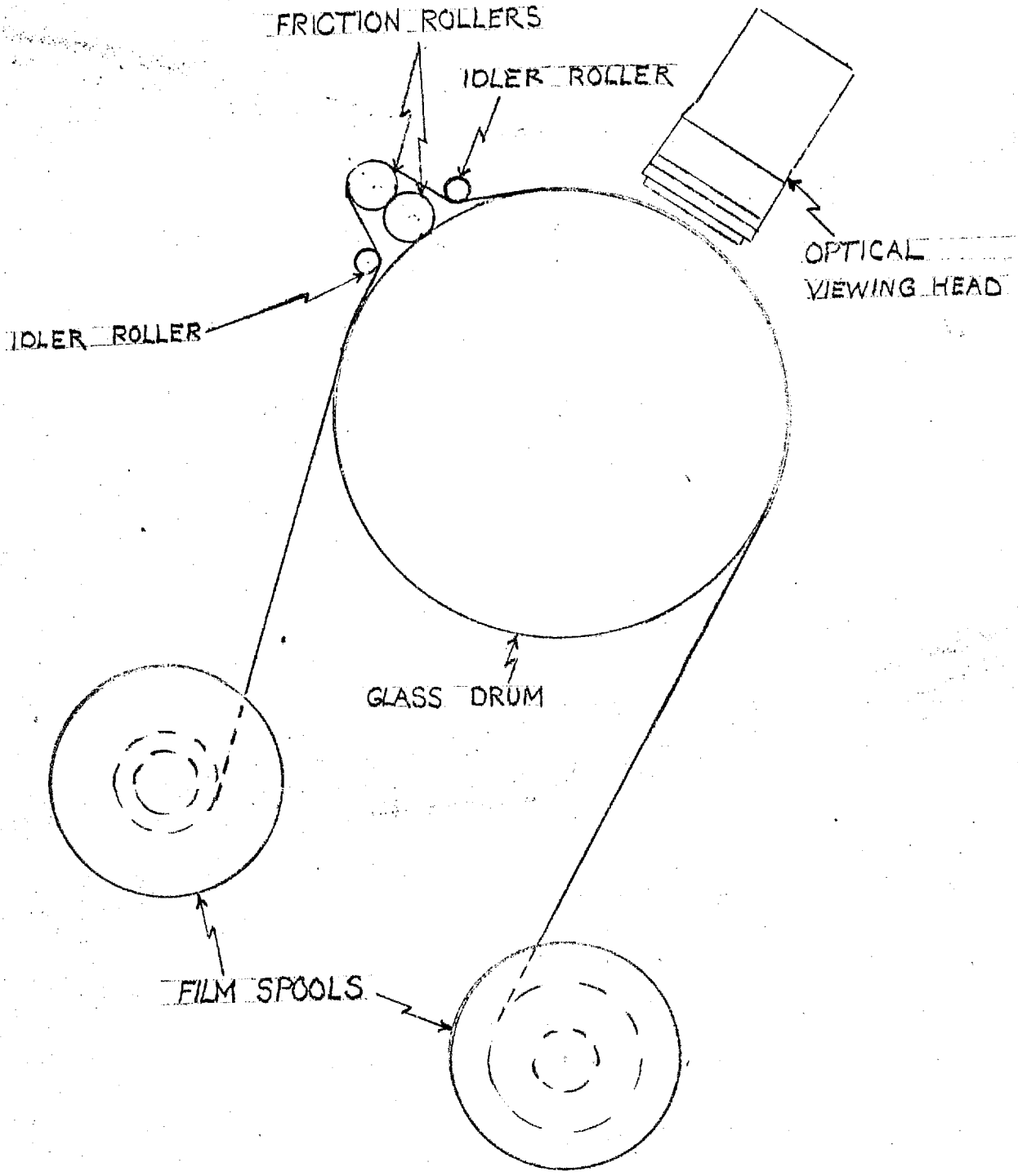


FIGURE 1

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and second friction roller. All rollers will rotate with a minimum of frictional drag on roller bearing supported shafts.

In "X" motor drive the film is tensioned over the drum and the upper (second) friction roller. It is driven by torque motors which are gear connected to the film spools - the same system as on the present instrument except for the addition of the friction rollers. The coefficient of friction between the upper friction roller and the film, drives the roller at the same surface velocity as the film. The roller in turn drives the other friction roller and drum at the same surface velocity as the film. Though the film in contact with the drum will assist in driving the drum as on the present system, the prime driving force for the drums will be the friction rollers.

To drive the film manually in "X" the present handwheels on the center column will be used. However, instead of driving the drum through a flexible drive to a large gear on the drum, the flexible drive will be gear connected to the upper friction roller which engages the film. The friction roller will in turn drive the film and the surface of the drum simultaneously at the same speed. The drive will be engaged by a magnetic clutch which will automatically disengage when driving the film in the motor mode. Tensioning the film will be through torque motors in both the manual and motor modes, as on the present instrument.

To couple the "X" manual or motor drives the existing telescoping drive shaft will be utilized after modification to strengthen it. However, the drive shaft will be gear connected to the friction

rollers which engages the film instead of the drums on the present instrument. A magnetic clutch to engage the "X" couple drive will be activated by the switch presently on the center column of the instrument. The "X" couple will assure a positive interlock between the two sides of the instrument and will permit the operator to drive the film with either (or both) joysticks without loss of the relative orientation between films on the two sides.

The maximum slew speed in the uncoupled motor drive will be approximately 200 feet per minute. In the coupled motor drive the maximum slew speed will be reduced approximately 50 percent when driving both sides of the instrument with one pair of torque motors. The operator may increase the coupled speed by energizing both joysticks in the coupled mode. The two sides will be compelled to drive at the same speed due to the mechanical couple.

A breadboard of the friction and idler roller part of the drive modification proposed has been made and installed in the instrument. The tests conducted with this breadboard give every indication that this modification will be a significant improvement in the operation of the instrument and permit a large reduction in the present required tension.

There are no proposed or anticipated modifications being considered in the "Y" manual or motor drive. It is believed that it is satisfactory as it now stands.

GLASS DRUMS

Four glass drums have been obtained for the viewer. It is proposed to replace the [illegible] glass drums now on the instrument with two

glass drums and furnish the other two as spares. The glass drums are dimensional more accurate, are of a better optical quality and are considerably more resistant to abrasion than the plastic drums now on the instrument.

The glass drums will require new mounts because of the differences in dimensions of the drum and the expansion characteristics of the glass.

RETICLES IN THE OPTICAL SYSTEM

On the present instrument there is no reference in the viewing system for coordinating imaging with the "X" and "Y" counters other than estimating the center of the field of view. It is proposed to mount dissimilar reticles, a circle and an open cross, in the two sides of the optical system for references. Unlike reticles are proposed to avoid the operator's tendency to try to fuse the reticles when viewing the film in stereo and also for easy identification of the reticle associated with the particular pair of counters being read.

The reticles would be positioned in the intermediate image plane on the objective side of the zoom system. This location is recommended to avoid lateral displacement of the reticle when zooming. The magnification change of the reticle would be the same as in the Zoom Macroscope (3 to 1) which it is believed would not be objectionable to the operator.

HEAD REST

Operation of the instrument has shown the need for a head rest. the standard head rest from the Variable Power Scanning Stereo-

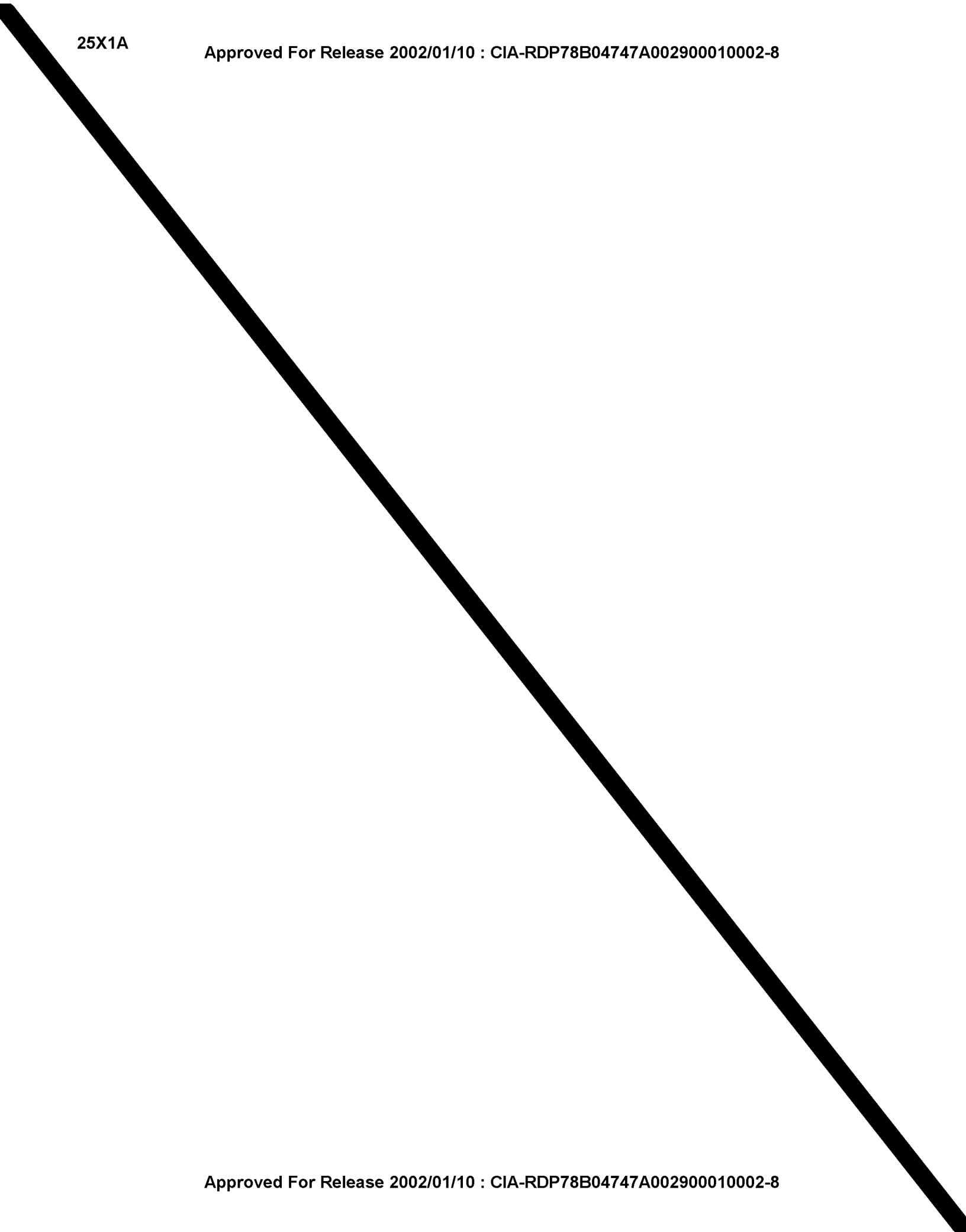
viewer has been installed on the instrument, however, some modification of the head rest is desirable because of the difference in the operator's viewing position.

## DIFFUSERS FOR THE CONDENSING SYSTEM

When operating the instrument at lower magnification the lamps for illuminating the format must be used at a low voltage. This results in the lamps operating at a low color temperature and introduces a noticeable amount of yellow into the projected format. Also there is a glare due to a hot spot in the center of the field at low magnification. A blue ground glass diffuser experimentally positioned below the anamorphic condenser eliminated the hot spot and filters out the objectionable yellow portion of the spectrum. It is proposed to permanently mount diffusers to the anamorphic condenser mounts.

## PRISM ROTATION RINGS

The prism rotation rings for image rotation are engraved to indicate the normal non-rotated orientation and the 90 degree rotated positions. It is proposed to replace rings with ones similar to those on the High Power Stereoviewer which indicate the image rotation in degrees for every 15 degrees.



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